

REMARKS

Claims 1-3 and 19-31 are pending in the application. All claims are rejected.

Claims 1-3, 19-23, 26, 27, 29 and 30 are rejected under 35 USC 103(a) as being unpatentable over Cooray et al., US 2003/0211328 in view of Prescher et al., US 6,143,816. This rejection is respectfully traversed.

Claims 1-3, 19-23, 26, 27 and 30 are directed towards an epoxy resin formulation, the epoxy resin component necessarily being “an epoxy resin advanced with phosphorus.” Claim 29 is directed towards a method for increasing the thermal stability of an epoxy resin formulation, again with the epoxy resin component necessarily being “an epoxy resin advanced with phosphorus.” In all of these claims boehmite is present in the formulation to enhance the thermal stability of the epoxy resin formulation.

The subject application makes clear the meaning of the expression, “an epoxy resin advanced with phosphorus.” See at least paragraphs [0003] and [0008] of Applicants’ specification. Reciting from paragraph [0003]:

“Thus, for convenience, the term "epoxy resin advanced with phosphorus" is used to denote a curable epoxy resin composition formed by partially reacting an epoxy resin with a co-reactive organophosphorus compound that contains an active hydrogen atom, which active hydrogen atom is attached either directly to phosphorus or is in a substituent which is attached to an aromatic ring and the hydrogen atom in the substituent is activated by the aromatic ring.”

And again paragraph [0003]:

“This invention is concerned only with epoxy resins which have been partially reacted with a reactive organophosphorus compound. Such reactive organophosphorus compound contains an active hydrogen atom that is (i) attached directly to phosphorus in a dialkyl phosphonate, diaryl phosphonate, dialkyl phosphite, diaryl phosphite, or diaryl phosphine; (ii) attached to an oxygen atom which is attached directly to phosphorus (*e.g.*, a phosphinic acid, dialkylphosphate, or diarylphosphate); or (iii) is in a substituent (*e.g.*, a

hydroxyl group) which is attached to an aromatic ring and is activated thereby, and which aromatic ring is bound to phosphorus.”

Note the requirement for an active hydrogen that enables the necessary reaction with the epoxy resin to obtain the "epoxy resin advanced with phosphorus" that is recited in all of the rejected claims.

Note further that organic phosphates that are free of substituents reactive with epoxy groups are considered by Applicants' to be non-reactive and, thus not productive of "epoxy resin advanced with phosphorus." See paragraph [0028]

The foundation of the Examiner's rejection of the above recited claims is Cooray et al. Cooray et al. is directed towards an epoxy resin composition that comprises (1) an epoxy resin, (2) a curing agent for the epoxy resin, (3) a phosphate of a resorcinol type, (4) aluminum hydroxide, and (5) a cure accelerator for the epoxy resin. Cooray et al. make it clear that their invention is limited to phosphate of the resorcinol type. In paragraph [0025] of Cooray et al. it is stated:

“In the composition of the invention, particularly a phosphate of a resorcinol type is used as a component imparting flame retardant properties to the composition. Conventional phosphate flame retardants are prone to dissolve in a plating solution to thereby make an insulation layer fragile, and, in addition, to bleed out at an elevated temperature, whereas the phosphate of a resorcinol type is free from such a defect, and can be used as a flame retardant of an addition type.”

Note that “phosphate of a resorcinol type” is not typified by the presence of a reactive hydrogen. In fact, resorcinol phosphates are devoid of such reactive hydrogens. It is submitted that “phosphates of a resorcinol type” are included in the non-reactive organic phosphates genre spoken of in paragraph [0028] of Applicant's specification.

Even further, attention is drawn to the last phrase of Cooray et al. paragraph [0025] which states: “...whereas the phosphate of a resorcinol type...can be used as a flame retardant of an addition type.” (emphasis added) There are two types of flame retardants, one being the

“additive type,” the other being the “reactive type.” The “additive type” is just that, an added component that does not react with the substrate to be flame retarded. The “reactive type,” on the other hand, reacts with the substrate and becomes part of its structure. In the instant situation, the “phosphates of a resorcinol type” are additives to the formulation while on the other hand, the reactive phosphorus compounds of Applicants’ invention are of the “reactive type” since they react with the epoxy resin substrate to yield "epoxy resin advanced with phosphorus."

Therefore, Cooray et al. is deficient in (1) teaching or suggesting the use of an "epoxy resin advanced with phosphorus" or even (2) teaching or suggesting the use of a reactive organophosphorus compound in combination with an epoxy resin. Cooray et al. only stands for the use an additive type of organophosphorus, i.e. phosphate of the resorcinol type. Whatever Cooray et al. has to say about boehmite, it is not curative of the foregoing serious deficiencies. Cooray et al. cannot, itself, support any rejection of Applicants’ claims.

The Examiner cites Prescher et al. to provide for a lack of Cooray et al. to teach the use of certain boehmites. Whatever Prescher et al.’s abilities are in that regard are moot in view of the just discussed deficiencies of Cooray et al. Certainly there is nothing in Prescher et al. to provide for these Cooray et al. deficiencies. Thus, the combination of Cooray et al. and Prescher et al. obtains nothing but a combination incapable of supporting the Examiners 103(a) rejection. Note also that Prescher et al. does not even relate to the art concerned with epoxy resins but instead is focused on thermoplastics such as polypropylene, polyamide and the like. See col. 2, lines 11-19 of Prescher et al.

Thus, the rejection of claims 1-3, 19-23, 26, 27, 29, and 30 under 35 USC 103(a) as being unpatentable over Cooray et al., US 2003/0211328 in view of Prescher et al., US 6,143,816 is not maintainable and should be withdrawn.

Claims 24-25, 28 and 31 stand rejected under 35 USC 103(a) as being unpatentable over Cooray et al. in view of Prescher et al and further in view of Okamoto et al., US 4,224,302. This rejection is respectfully traversed.

The individual and joint deficiencies of Cooray et al. and Prescher et al. have already been discussed and are repeated here in regard to the just described rejection.

Okamoto et al. does nothing to cure the deficiencies of Cooray et al., Prescher et al. or their combination. Okamoto et al. is directed to a catalyst carrier of high strength that contains boehmite. Okamoto et al. is completely silent about an "epoxy resin advanced with phosphorus" or even the use of a reactive organophosphorus compound in combination with an epoxy resin. Thus, Okamoto et al. is deficient in the same manner as are Cooray et al. and Prescher et al. and thus, its combination with Cooray et al. and Prescher et al. yields nothing more than a combination of prior art that is still deficient in the same regard as are the individual references. This rejection should also be withdrawn.

It is believed that the application is in condition for allowance, and notice to that effect is solicited. If, however, any matters remain that require further consideration, the Examiner is requested to telephone the undersigned so that such matters can be discussed, and if possible promptly resolved.

Respectfully submitted,

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